

49. A cast polyurethane article obtained by a process according to claim 33.

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the following remarks.

Claims 1-19 are pending in this application.

Claims 1-19 have been cancelled.

New claims 20-49 contain no new matter. The new claims are supported by the written description and claims as originally filed.

1. Requirement for Abstract

The application has been amended to include an abstract of the disclosure in compliance with 37 C.F.R. 1.72(b).

2. The Rejections under 35 U.S.C. § 112, second paragraph

The claims stand rejected as indefinite under the second paragraph of 35 U.S.C. § 112 on various grounds.

a. "Can Be" and "Can Have" in Claims 1, 7 and 16

The Office asserts that use of the phrases "can be" and "can have" within claims 1, 7 and 16 renders the claims indefinite.

Applicants have obviated this rejection by avoiding the use of these phrases in new claims 20-49.

b. Component (a) of Claims 1 and 10: Isocyanate and Polytetramethylene Glycol

The Office asserts that, when not in the form of a prepolymer, "it is unclear how the isocyanate component of claims 1 and 10 contains polytetramethylene glycol."

Applicants respectfully traverse the rejection. The isocyanate component may be an isocyanate/polytetramethylene glycol prepolymer, or the component may contain an isocyanate together with polytetramethylene glycol, wherein the materials have not yet been reacted together.

c. "Obtainable by" in Claim 10

The Office asserts that the phrase "obtainable by" in claim 10 renders the claim indefinite, because one cannot determine which compositions are "obtainable by" Applicants' process, and which are not.

Applicants have obviated this rejection by using the word "obtained" in new claim 49.

d. Percentage values in Claims 2 and 11: weight or mole

The Office asserts, "applicants have failed to specify the type (weight or mole) and basis for the claimed percent values."

Applicants have obviated this rejection by specifying percent by weight in the new claims, as supported by the written description at page 7, line 3.

e. "Polyol" and "Polytetramethylene glycol" in Claims 6 and 15

The Office asserts that within claims 6 and 15, "it is unclear how the polyol relates to the polytetramethylene glycol component; it is unclear if the polytetramethylene glycol and the polyether polyol are mutually exclusive."

Applicants respectfully traverse the rejection. The intended meaning of claims 6 and 15 is that while polytetramethylene glycol is required in element (a), the composition may contain other polyether and/or polyester polyols. Support for this meaning is present in the specification at page 3, lines 13-14 and page 9, lines 11-14.

f. Extra comma in Claim 4

The Office notes that there is an extra comma in the last line of claim 4. This typo does not appear in the new claims.

g. Clarification of Process defined by Claim 19

The Office asserts that the process of claim 19 is "confusing" for the reasons stated in the Action at the top of page 3.

Applicants have obviated this rejection by substituting new claim 33.

3. The Rejection of Claims 1-3, 7, 10-12 and 16 under 35 U.S.C. § 102(b) in view of Werner

Claims 1-3, 7, 10-12 and 16 stand rejected under 35 U.S.C. § 102(b) in view of U.S. Patent 3,980,606 (Werner).

Werner does not anticipate new claims 20-49. The specific class of plasticizers defined by component (c) in composition claims 20-32 (corresponding for formulae IA, IIA and III) is not disclosed in Werner. Furthermore, Werner does not disclose a process wherein the steps of mixing, molding and curing are all carried out at room temperature (as recited in new claims 33-48).

Werner is concerned with the high-temperature casting of pneumatic tires from polyurethanes, and his invention is the provision of a very specific blend of two defined prepolymers, cured with a hindered aromatic diamine. The general description contains no mention of plasticizers. The plasticizers mentioned in Examples III and IV are species of the class of compounds described in Applicants' formulae IB and IIB.

4. The Rejection of Claims 1-4, 7, 10-13 and 16 under 35 U.S.C. § 102(b) in view of JP 6-16767

Claims 1-4, 7, 10-13 and 16 stand rejected under 35 U.S.C. § 102(b) in view of JP 6-16767. Applicants respectfully traverse.

JP 6-16767 describes a four-part composition containing (1) a urethane prepolymer, (2) an aromatic diamine, (3) a plasticizer, and (4) a catalyst that “accelerates the reaction of isocyanate groups and amino groups” (paragraph 15 of the English language translation submitted with Applicants’ May 28, 2002 Supplemental IDS). According to the text in paragraph 17 of the English language translation, the catalyst is a required element of the four-part JP 6-16767 composition:

“Furthermore, when the ratio of (4) [the catalyst] is less than 0.05, it is inadequate in attaining the aimed performance, because a long period of time is required before reaching gelation.”

Thus, JP 6-16767 teaches away from any system that does not include a catalyst. As such, JP 6-16767 cannot be read to enable a three-part system without a catalyst. Accordingly, JP 6-16767 does not anticipate Applicants’ three-part system, which is capable of room temperature curing free of a catalyst.

5. The Rejection of Claims 4-9 and 13-19 under 35 U.S.C. § 103(a) in view of Werner or JP 6-16767, each in view of Singh et al. and further in view of Rizk et al. and Gabbard et al.

Claims 4-9 and 13-19 stand rejected under 35 U.S.C. § 103(a) in view of Werner or JP 6-16767, each in view of U.S. Patent 5,077,371 (Singh et al.), and further in view of U.S. Patent 5,817,860 (Rizk et al.) and U.S. Patent 5,232,956 (Gabbard et al.). Applicants respectfully traverse.

With regard to obviousness, the key advantage of the present invention is that it provides compositions with desirable properties that are capable of being cast and cured at room temperature to give products that have only slight or no distortion as a result of the curing process (Example 3), and which have superior elasticity, toughness, tear strength and abrasion resistance. This is an unusual set of properties. Especially given the fact that warping is a normal feature of compositions of the general category within which the present invention falls.

The Office takes the position that "it would have been obvious to cure the prior art compositions at the claimed temperature range, in view of the use of the highly reactive diamine curing agents." However, this view ignores the fact that processing at room temperature represents an enormous technical breakthrough compared with processing at elevated temperature. No one of skill in the art would choose to cast and cure at elevated temperature if the process could be successfully carried out at room temperature. Not surprisingly then, casting and curing at elevated temperature is precisely and exclusively what the prior art teaches. Curing in Werner is carried out at temperatures of 100°C to 130°C (column 2, lines 7-8), with the Examples illustrating high-temperature curing at 120°C. The compositions of JP 6-16767 are all cured at elevated temperature; paragraph 20 discusses the preheating of the various liquid components of the composition before mixing, the preheating of the mold in which curing is to be carried out, and a further step of continuing the curing at elevated temperature after the mold has been opened. The specific examples describe the use of preheated tanks at 60°C and curing at 80°C.

Applicants' invention provides breakthrough room-temperature moldable and curable compositions by the selection of a specific combination of ingredients, and in particular, the

selection of a particular class of plasticizers with a defined vapor pressure. The disclosures in Werner and JP 6-16767 are very general, and the function of the plasticizer in these references appears to be entirely conventional. No specific properties are sought from the plasticizer used in these references, nor is there any indication that any particular plasticizer or group of plasticizers would have any particularly useful properties (such as minimizing distortion).

The Office also takes the view that "the reaction rates of amine cured prepolymers were well understood at the time of invention and it would have been within the purview of the skilled artisan to tailor their curing profiles." This may be so within the realm of high-temperature curing, but for the reasons given below, could not have been extended to room temperature curing. The Office further suggests that it would have been obvious to incorporate within the compositions of the primary references the curing agent and plasticizers of the secondary references. These views could only be gained through the benefit of hindsight. There is nothing easy about tailoring profiles to transform a composition from one that is curable at high temperatures to one that is curable at room temperature. Moreover, there is nothing in either the primary or secondary references to suggest a combination of components that would result in a composition capable of being cast and cured at room temperature. Any one of a vast range of curing agents and plasticizers available in the prior art *could* be incorporated into the compositions of Werner and JP 6-16767, but there is no indication anywhere in the prior art as to *which* curing agents and plasticizers, or indeed whether *any* particular combination of curing agent and plasticizer would result in the highly desirable properties of room temperature castability and curability, and distortion control.

Singh et al. does not disclose room temperature curing; see Table 1, column 5 where final curing is carried out at 100°C. Rizk et al. and Gabbard et al. are concerned with compositions

for blowing polyurethane foams and are very different from the present invention. Both references contain very broad, general disclosures that plasticizers may be used in the preparation of prepolymers, and list a large number of known plasticizers. Neither reference provides any suggestion that any particular plasticizer could provide the benefits of the present invention when used in combination with an aromatic amine curative.

Of course, a person of ordinary skill in the art *could* have selected Applicants' specific combination of (a), (b) and (c) from the various pieces of prior art and combined them, but to do so he or she would have had to select from an enormous number of possibilities and Applicants respectfully submit that such a selection would not have been obvious. The specific combination of (a), (b) and especially (c) in the present invention provides compositions having a unique and very valuable property, that of room temperature castability and curability to produce high quality cast products, and this could not have been foreseen on the basis of the prior art.

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested.

As noted above, Applicants submitted a Supplemental Information Disclosure Statement on May 28, 2002. Applicants request that the Office return an initialed Form PTO-1449 with the next Office communication.



The Commissioner is authorized to charge any fee due, or credit any overcharge as a result of this Amendment and Response to Deposit Account No. 16-2500.

Respectfully submitted,
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